

The picture below represents the trajectory of three different basketballs thrown by the same person from the same distance away from the hoop. The only thing different between each thrown is the angle at which the shooter decides to release the ball. Notice that the shooter is releasing the ball at a different angle, but the ball still makes it into the hoop. Top trajectory is the 53-degree shot, middle trajectory is the 45-degree shot and the bottom trajectory is the 35-degree trajectory shot.

1. If the shooter releases the ball at (0, 7) and all the balls go through the hoop at the point (13.5, 10), using the other points provided, find the equations for all three trajectories.

2. Identify the maximum height the ball reaches at each of the different three trajectories. (Be sure to include proper units…)

3. The front of the rim is located at (13, 10). How far back does the shooter need to step back for the ball to bounce off the front of the rim? (Be sure to include proper units…)

4. Chose one of the three trajectories. From what height does the player need to release the ball (still 14.5 feet from the backboard), such the ball bounces off the top of the backboard at (14.5, 13), where the shots continue to have the same trajectory as before?